WHAT WE CLAIM IS

1. A sp3-bonded boron nitride, represented by a general formula BN, having a hexagonal 5H or 6H polytypic form and having a property of emitting light in ultraviolet region.

2. A producing method of a sp3-bonded boron nitride, represented by a general formula BN, having a hexagonal 5H or 6H polytypic form and having a property of emitting light in ultraviolet region, the method comprising: introducing reaction mixed gas containing boron and nitrogen being diluted with dilution gas into a reaction chamber; and irradiating a surface of a substrate placed in the chamber, a growing surface on the substrate, and a growing spacing region about the growing surface with ultraviolet light to cause gas phase reaction, thereby generating, depositing, or growing a sp3-bonded boron nitride, represented by a general formula BN, having a hexagonal 5H or 6H polytypic form and having a property of emitting light in ultraviolet region on the substrate.

3. A producing method of a sp3-bonded boron nitride, represented by a general formula BN, having a hexagonal 5H or 6H polytypic form and having a property of emitting light in ultraviolet region, as claimed in claim 2, wherein the dilution gas is noble gas, hydrogen, nitrogen, or mixed gas consisting of two or more of these and the ratio of the reaction gas to the dilution gas is 100:0.0001-100% by volume.

4. A producing method of a sp3-bonded boron nitride, represented by a general formula BN, having a hexagonal 5H or 6H polytypic form and having a property of emitting light in ultraviolet region, the method comprising: inserting boron nitride as a boron raw material into a reaction chamber while introducing reaction mixed gas containing nitrogen being diluted with dilution gas into the reaction chamber; converging and emitting ultraviolet laser of from 190 nm to 400 nm wavelength onto the boron nitride solid raw material so as to vaporize, generate radical containing boron or BN precursor matter; and irradiating a surface of a substrate placed in the chamber, a growing surface on the substrate, and a growing spacing region about the growing surface with ultraviolet light to cause gas phase reaction between the reaction gas containing nitrogen and the radical containing boron or re-coagulation reaction of the BN precursor matter in the vaporized state, thereby generating, depositing, or growing a sp3-bonded boron nitride, represented by a general formula BN, having a hexagonal 5H or 6H polytypic form and having a property of emitting light in ultraviolet region on the substrate.

5. A producing method of a sp3-bonded boron nitride, represented by a general formula BN, having a hexagonal 5H or 6H polytypic form and having a property of emitting light in ultraviolet region, the method comprising: inserting boron nitride as a boron raw

material into a reaction chamber while introducing reaction mixed gas containing boron and nitrogen being diluted with dilution gas into the reaction chamber; irradiating the boron nitride solid raw material with plasma as well as ultraviolet laser of from 190 nm to 400 nm wavelength so as to vaporize, generate radical containing boron or BN precursor matter; and irradiating a surface of a substrate placed in the chamber, a growing surface on the substrate, and a growing spacing region about the growing surface with ultraviolet light to cause gas phase reaction between the reaction gas containing nitrogen and the radical containing boron or re-coagulation reaction of the BN precursor matter in the vaporized state, thereby generating, depositing, or growing a sp3-bonded boron nitride, represented by a general formula BN, having a hexagonal 5H or 6H polytypic form and having a property of emitting light in ultraviolet region on the substrate.

6. A producing method of a sp3-bonded boron nitride, represented by a general formula BN, having a hexagonal 5H or 6H polytypic form and having a property of emitting light in ultraviolet region, as claimed in claim 4 or 5, wherein the dilution gas is noble gas, hydrogen, nitrogen, or mixed gas consisting of two or more of these and the ratio of the reaction gas to the dilution gas is 100:0-100% by volume.

7. A producing method of a sp3-bonded boron nitride, represented by a general formula BN, having a

hexagonal 5H or 6H polytypic form and having a property of emitting light in ultraviolet region, as claimed in claim 4 or 5, wherein the ultraviolet laser is pulse laser.

8. A producing method of a sp3-bonded boron nitride, represented by a general formula BN, having a hexagonal 5H or 6H polytypic form and having a property of emitting light in ultraviolet region, as claimed in claim 5 or 7, wherein by applying modulation synchronizing laser pulse onto the plasma, the plasma is packeted so as to generate, deposit, and grow a sp3-bonded boron nitride, represented by a general formula BN, having a hexagonal 5H or 6H polytypic form and having a property of emitting light in ultraviolet region and which has improved crystalline property.

9. A functional material containing a sp3-bonded boron nitride, represented by a general formula BN, having a hexagonal 5H or 6H polytypic form and having a property of emitting light in ultraviolet region as claimed in claim 1, wherein the functional material is used for applications utilizing the properties of the boron nitride compound contained therein.

10. A functional material as claimed in claim 9, wherein the functional material is used mainly as material emitting light in ultraviolet region.

11. A functional material as claimed in claim 9, wherein the functional material is used mainly as an electronic material, particularly light-emitting diode.

12. A functional material as claimed in claim 9, wherein the functional material is used mainly as surface coating material on cutting tool.